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Title: ALL-PRIMARY TYPE GAS BURNER ;

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Inventor(s): KEE HEUI-TAE (KR) ;

Applicant(s): SAMSUNG ELECTRONICS CO LTD (KR) ;

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IPC Classification: F23D14/20 ;

Equivalents: DE3928179, FR2639092, IT1237063 ;

ABSTRACT:

An all-primary type gas burner which achieves exceptional heating capacity with a small combustion surface. The burner comprises a ceramic radiation plate, mixed gas distributors, a burner main body, upper and lower laterally extending supporting base plates, gas mixing tubes, Venturi-tubes, an air control plate, air control disks, and nozzles. The ceramic radiation plate broadly disperses combustion heat in all directions. It comprises a large number of ceramic rectangular tubes of varying lengths arranged so as to form a semi-cylinder projecting from the burner main body. At the tip of each tube is a gas blowing hole. The diameter at the bottom of the semi-cylinder is greater than that at the top. The mixed gas distributors uniformly distribute mixed gas so that it blows out all of the gas blowing holes with approximately uniform gas pressure. The mixed gas distributors each have a large number of gas distributing holes.

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(71) Applicant
Samsung Electronics Company Limited

(Incorporated in the Republic of Korea)

416 Maetan-dong, Kwonsun-ku, Suwon-city, Kyonggi-do, Republic of Korea

(72) Inventors
Heul Tae Kee

(74) Agent and/or Address for Service
Marks & Clerk
57-60 Lincoln's Inn Fields, London, WC2A 3LS, United Kingdom

(54) Gas burner

(57) A gas burner, e.g. for a room heater or gas cooker is formed with a curved apertured ceramic radiation plate A at which the gas is burnt, whereby the combustion heat is more broadly dispersed. Mixed air and gas is distributed by first and second distributors 3, 4 having gas distributing holes 3a, 3a' and 4a to the curved radiation plate which comprises rectangular ceramic tubes 7 each having a gas port 7a through which the gas exits at uniform pressure.

FIG. 1

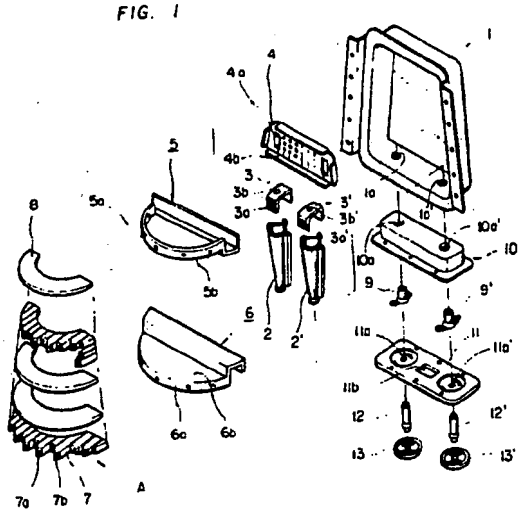
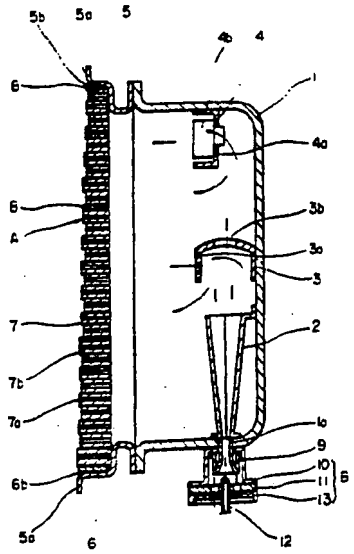


FIG. 2



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

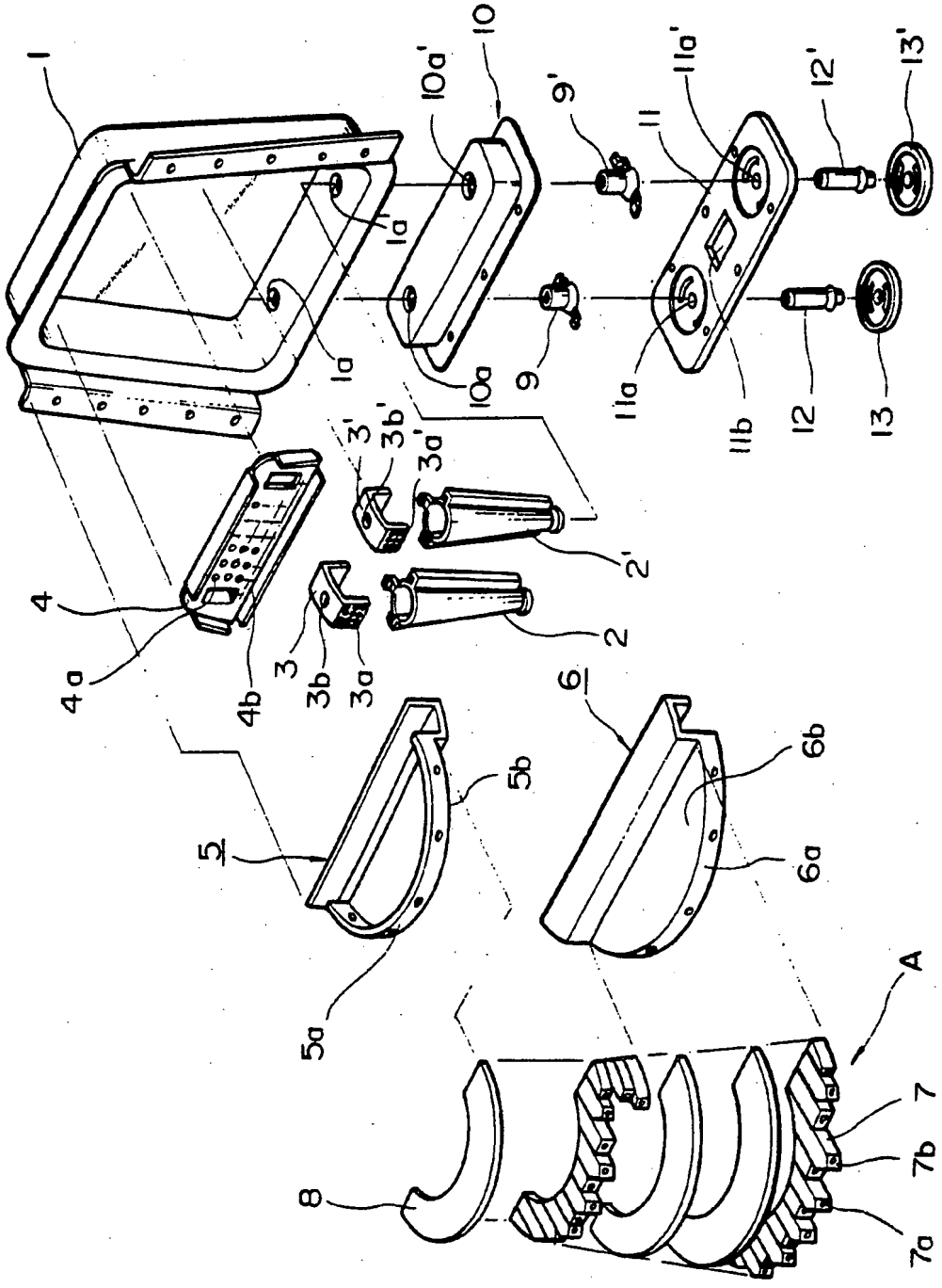
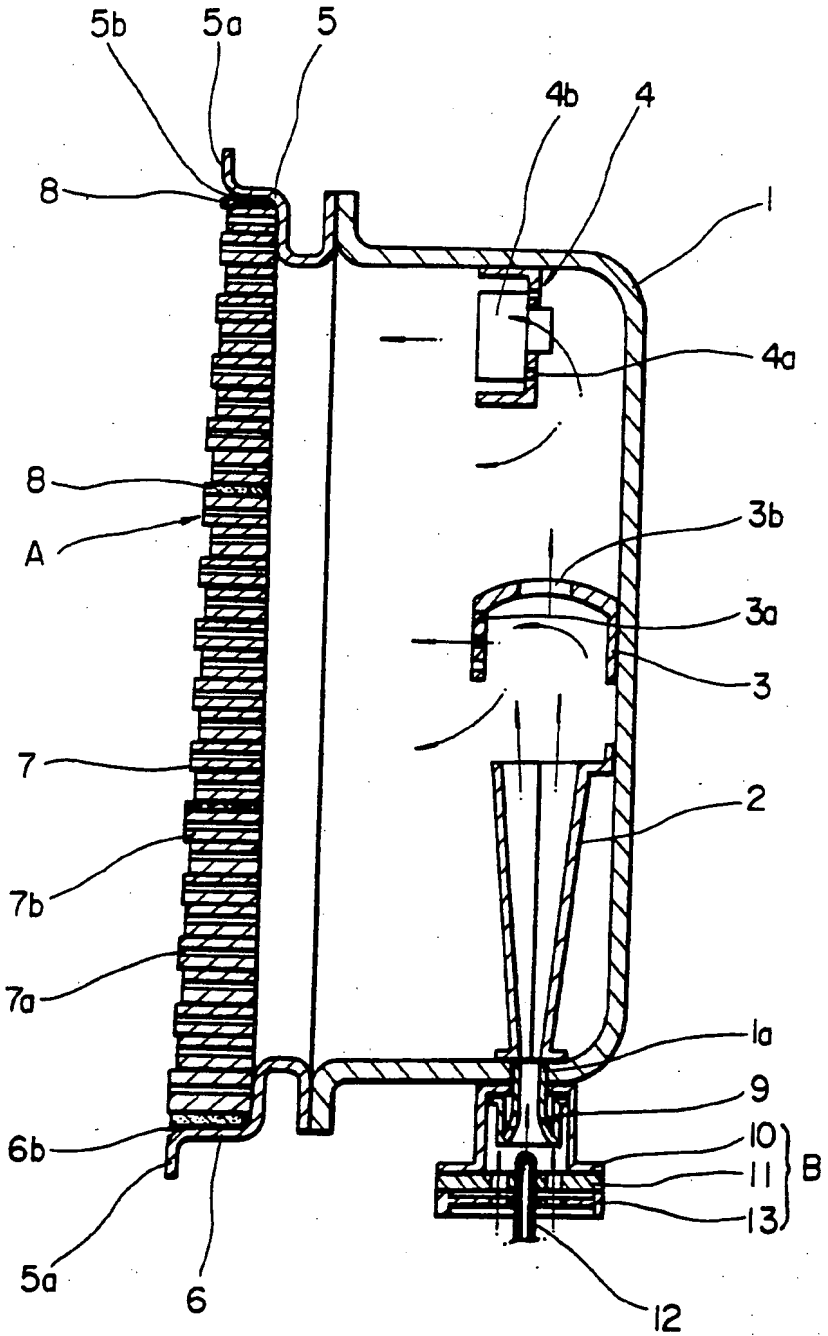

1
1a
10a'
10
9'
11
11a'
12'
13'
10a
9
11a
11b
12
13
3'
3b'
3a'
2'
4
4a
4b
3
3b
3a
2
5
5b
5a
6
6b
6a
A
8
7
7b
7a

FIG. 1

FIG. 2



GAS BURNER

The present invention relates to a gas burner used for room heating apparatus or cooking and the like, and more particularly, to a gas burner in which the burning of gas is obtainable by the primary air sucked in together with the gas.

Heretofore, such gas burners provided in a gas appliance has employed planar ceramic plates as radiation plates, and were formed so as to be supplied with gas from one nozzle. Radiation heat emitted from the planar pattern type ceramic plate emits only in the frontward direction of the ceramic plate so the radiation efficiency is poor except directly forward of the plate. Since only one nozzle is used, the capacity is small and a large number of separate planar pattern type ceramic radiation plates are required in order to produce good heating and there has been also a problem that the burning condition at the surface of the planar ceramic radiation plates becomes unstable.

It is an object of the invention to at least reduce these disadvantages of conventional appliances as aforementioned.

According to the present invention there is provided a gas burner comprising a body having in its base one or more gas inlet nozzles to direct gas into respective mixing tubes, the flow of gas in use drawing in air to mix with the gas;

respective mixed gas distributing means mounted above each gas mixing tube within the body to distribute the mixed gas to the interior of the burner;

upper and lower supporting base plates which are fixed to the upper and lower peripheral edges respectively at the front of said body, being formed with forward facing curved surfaces ; and

a curved apertured ceramic radiation plate fixed between said upper and lower supporting plates to radiate heat and allow burning of the mixed gas distributed from said mixed gas distributing means at the surface thereof.

A gas burner according to the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is an exploded perspective view of the gas burner; and

Figure 2 is a cross-sectional side view showing

the assembled gas burner.

Referring to the drawing, in Figure 1 a gas burner for mounting within the room includes an air control plate case 10 on the exterior of the bottom of the burner main body 1. Gas mixing tubes 2, 2' diverging gradually toward the interior are mounted to the body 1 and dome shaped first gas distributers A 3, and 3' are supported approximately at the central height of the body 1. The distributers 3, 3' are perforated with a large number of frontward facing gas distributing ports 3a, 3a' and also with ports 3b, 3b' on the top surface thereof. Secondary gas distributors, B 4 are fixed near to the top internal surfaces of the body 1 and have a large number of gas distributing ports 4a and guide plates 4b around the periphery thereof. Upper and lower supporting base plates 5, 6 are respectively fixed to the upper and lower edge portion of the body 1 which are formed respectively with curved forward facing surface portions 5a, 6a and laterally extending support plates 5b, 6b. A composite curved ceramic radiation plate A is fixed between the laterally extending support plates portions 5b, 6b of the upper and lower supporting base plates 5, 6 by surrounding insulation materials 8. The plate A is formed with a large number of rectangular ceramic tubes 7 differing from one another in length and having gas ports 7a at their tips, which are of semi-cylindrical form. Venturi-tubes 9, 9' are mounted

adjacent to the accesses 10a, 10a' within the air control plates case 10. A plate 11 supports the air suction inlets 11a, 11a', nozzles 12, 12', and air control disks 13, 13'.

In operation, and referring to Figure 2, gas is supplied for combustion and passes from said nozzle 12, 12' through the Venturi-tubes 9, 9'. The low pressure regions created by the Venturi effect which is lower than the outside ambient atmospheric pressure, causes air to be sucked in from the outside environment through the air control disks 13, 13' and air suction inlets 11a, 111' and 11b formed at the air control plate main body 11.

The sucked-in air and gas are mixed within the gas mixing tubes 2, 2' and the mixed gas is distributed partly to the lower end portion within the body 1 and hence to the lower part of the curved ceramic radiation plate through the front facing gas distribution ports 3a. The remaining part of mixed gas passes towards the internal surface of the ceiling plate of the body 1 through the top gas distributing openings 3b, 3b'. This part of the mixed gas is distributed to the upper portion of the ceramic radiation plate through the second gas distributor ports 4a. In this way, mixed gas is distributed within the whole interior of the body with substantially uniform gas pressure. The

distributed uniform pressure mixed gas exits out of the gas ports 7a of the radiation plate emitted to the ambient atmosphere, and being ignited (by usual igniting means, not shown) burns on the surface of ceramic plate. The semi-cylindrically formed projected portions 7b of the rectangular ceramic tubes 7 is normally heated to red heat so that the radiation heat is radiated to generally throughout the room.

As the ceramic radiation plate is curved and also generally trapezoidal in front elevation, the emitting direction of the radiation heat is broadly dispersed and thereby the room heating efficiency is increased. Since there can be many nozzles 12, 12' as well as appropriate distributors, the suction rate of the primary air and the combustion efficiency are greatly improved. The heating capacity for a unit volume can be increased as compared to prior art burners, and therefore, there is advantage in that products according to the invention can be provided compactly with high combustion efficiency.

It will be appreciated that the present invention is not restricted to the particular embodiment that has been described hereinbefore, and that variations and modifications may be made without departing from the scope of the invention as defined in the appended claims and the equivalents thereof.

What is claimed is:

1. A gas burner comprising a body having in its base one or more gas inlet nozzles to direct gas into respective mixing tubes, the flow of gas in use drawing in air to mix with the gas;

respective mixed gas distributing means mounted above each gas mixing tube within the body to distribute the mixed gas to the interior of the burner;

upper and lower supporting base plates which are fixed to the upper and lower peripheral edges respectively at the front side of said body, being formed with forward facing curved surfaces; and

curved apertured ceramic radiation plate fixed between said upper and lower supporting plates to radiate heat and allow burning of the mixed gas distributed from said mixed gas distributing means at the surface thereof.

2. A gas burner according to Claim 1, wherein each mixed gas distributing means comprises a first gas distributor arranged such that some of the mixed gas from said respective gas mixing tube is distributed to a lower portion within the body through forward facing gas distributing ports therein, and the remaining part of

the mixed gas is distributed towards the internal surface of the top of the body, and a second gas distributor mounted above said first gas distributor to distribute the remaining mixed gas received from the top side of the first gas distributor forwards towards the upper portion of the radiation plate.

3. A gas burner according to Claim 1 or 2, wherein said curved ceramic radiation plate is formed of a number of parts assembly to form the curved plate and has a cross-sectional front elevation which is trapezoidal, being wider at the bottom.

4. A gas burner substantially as herein described with reference to Figures 1 and 2 of the accompanying drawing.

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